

4.9 Combining Functions

Name _____ Period _____ Date _____

Find an algebraic expression for $h(x)$ using the given functions. Simplify if possible. Determine the domain, in interval notation, for each a , b , c , and d .

1. $f(x) = 2x + 1$ and $g(x) = -x^2$

a. $h(x) = (f + g)(x)$

b. $h(x) = (f - g)(x)$

c. $h(x) = (fg)(x)$

d. $h(x) = \left(\frac{f}{g}\right)(x)$

2. $f(x) = \frac{2x+3}{3x-2}$ and $g(x) = \frac{4x}{3x-2}$

a. $h(x) = (f + g)(x)$

b. $h(x) = (f - g)(x)$

c. $h(x) = (fg)(x)$

d. $h(x) = \left(\frac{f}{g}\right)(x)$

3. $f(x) = x^2 + 3x - 4$ and $g(x) = 2x + 1$

a. $h(x) = (f + g)(x)$

b. $h(x) = (f - g)(x)$

c. $h(x) = (fg)(x)$

d. $h(x) = \left(\frac{f}{g}\right)(x)$

4. $f(x) = \frac{1}{x} + 1$ and $g(x) = 4x$

a. $h(x) = (f + g)(x)$

b. $h(x) = (f - g)(x)$

c. $h(x) = (fg)(x)$

d. $h(x) = \left(\frac{f}{g}\right)(x)$

5. $f(x) = (x + 3)^2$ and $g(x) = \sqrt{x} - 3$

a. $h(x) = (f + g)(x)$

c. $h(x) = (fg)(x)$

b. $h(x) = (f - g)(x)$

d. $h(x) = \left(\frac{f}{g}\right)(x)$

Evaluate each of the following using the given function. SHOW WORK!

Let $f(x) = 2x - 1$, $g(x) = \sqrt{x + 5}$, and $h(x) = \frac{x}{x - 3}$

6. $f(1) - g(4)$

7. $2f(-3) - f(5)$

8. $\frac{f(1)}{g(-1)}$

9. $g(4) \cdot h(6)$

Let $f(x) = x^2 + 2$, $g(x) = 3\sqrt{x + 1}$, $h(x) = 3^{(x-2)}$, and $k(x) = \frac{2x}{x-3}$

10. $(f \cdot g)(2)$

11. $h(\pi) - 4k(0)$

12. $(f + g)(3)$

13. $(f - g)(4)$

Find the indicated composition function and its domain, using the given functions. Show work!

14. $f(x) = 3x + 2$

$$g(x) = x - 1$$

a) $h(x) = (f \circ g)(x)$

b) $h(x) = (g \circ f)(x)$

c) $h(x) = (f \circ f)(x)$

d) $h(x) = (g \circ g)(x)$

Find the indicated composition function and its domain, using the given functions. Show work!

15. $f(x) = x^2 - 1$

$$g(x) = \frac{1}{x-1}$$

a) $h(x) = (f \circ g)(x)$

b) $h(x) = (g \circ f)(x)$

c) $h(x) = (f \circ f)(x)$

d) $h(x) = (g \circ g)(x)$

16. $f(x) = \frac{1}{x-1}$

$$g(x) = \sqrt{x}$$

a) $h(x) = (f \circ g)(x)$

b) $h(x) = (g \circ f)(x)$

c) $h(x) = (f \circ f)(x)$

d) $h(x) = (g \circ g)(x)$

Evaluate each composition function using the given functions.

$$f(x) = 3x^2 - 1$$

$$g(x) = \sqrt{x-1}$$

$$h(x) = \frac{x-2}{x-3}$$

17. $(f \circ g)(1)$

18. $(g \circ f)(5)$

19. $(h \circ f)(4)$

20. $(g \circ g)(26)$

21. $(f \circ f)(-1)$

22. $(h \circ h)(4)$

Review

23. Write the polynomial in factored form with zeros of -4, 2, 0.

24. Divide using synthetic division. $\frac{2x^4 - 3x^2 - 5x + 10}{x - 2}$

25. Factor. $20x^2 - 45y^2$